

The Effect of under Nutrition on Schooling, Adult Productivity and Economic Growth in South -West Madhya Pradesh, India

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Abstract— This study revealed the impact of malnutrition on schooling, learning and the lifetime earning potential of the child. For decades, south-west Madhya Pradesh (MP) has been one of the state's worst malnutrition affected area in India. According to the Global Hunger Index, malnutrition in the south western tribal areas of the state is even more concerning. Average rate of malnutrition in children under 5 is already "extremely alarming" According to Rural Health Commission the proportion of underweight children in these districts can range from 61-96%. Malnutrition is rampant throughout almost every town in south western MP. During collection of data in the districts of Jhabua, Alirajpur, Khandwa, Khargone and Burhanpur in 2010 it was found that in rural areas every second children are affected by malnutrition. Data collected from these districts are analyzed at SPSS software. It was found that better health conditions increase workers productivity, reduce ill days and increase working capacity of the labour by reducing morbidity and disability. Education which plays a vital role in economic development can only be effective if there is good health. It is true that schooling pays off in terms of higher incomes, but such gain is bounded by good health. Poor health and malnutrition reduce the gains of schooling in three areas, enrolment, ability to learn and participation by girls, poor health children lagged behind in education and learning. Therefore, health and education are inter-linked and can only maximize adult productivity and economic growth.

Keywords- Under Nutrition; Economic Growth; Productivity; Schooling.

I. INTRODUCTION

"Health and strength, physical, mental and moral are the basis of industrial wealth; while conversely the chief importance of material wealth lies in the fact that when wisely said, it increases the health and strength, physical, mental and moral, of the human race". World Bank Report (1991). Malnutrition at any stage of childhood affects schooling and, thus the lifetime earning potential of the child. Some of the pathways through which malnutrition affects educational outcomes include a reduced capacity to learn (as a result of early cognitive deficits or lowered current attention) and fewer total years of schooling (since caregivers may invest less in malnourished children or schools may use child size as an indicator of school readiness). For example, in rural area of

Madhya Pradesh, malnutrition has been found to decrease the probability of ever attending school, particularly for girls. In the Philippines, children with higher nutritional status during the preschool years start primary school earlier, repeat fewer grades and have higher high school completion rates than other children. Measuring the productivity losses associated with under nutrition is complex and since different studies incorporate different types of productivity gains, estimates can vary widely. Moreover, since a large share of productivity losses are measured in terms of foregone wages, when productivity losses are expressed in money terms rather than in % Gross domestic product, the productivity losses in India may appear lower relative to other countries with higher average wages. In general, in low income agricultural Asian countries, the physical impairment associated with malnutrition is estimated to cost more than 2-3% of GDP per annum - even without considering the long-term productivity losses associated with developmental and cognitive impairment. Iron deficiency in adults has been estimated to decrease productivity by 5-17%, depending on the nature of the work performed. Other data from ten developing countries have shown that the median loss in reduced work capacity associated with anaemia during adulthood is equivalent to 0.6% of GDP, while an additional 3.4% of GDP is lost due to the effects on cognitive development attributable to anaemia during childhood. The impact of iodine deficiency disorders (IDD) on cognitive development alone has been associated with productivity losses totalling approximately 10% of GDP. A few attempts have been made to estimate the productivity losses associated with malnutrition in India. As with the global estimates above, these are intrinsically imprecise, requiring many assumptions and approximations. One study estimates that the productivity losses due to Protein energy malnutrition (PEM), iodine deficiency disorders (IDD), and Iron deficiency anaemia (IDA), in the absence of appropriate interventions, amounts to around US\$114 billion between 2003 and 2012. A more recent study, examining only the productivity losses associated with foregone wage-employment resulting from child malnutrition, estimates the loss to be US\$2.3 billion (or Rs.103 billion). Other studies suggest that micronutrient deficiencies alone may cost India US\$2.5 billion annually and that the productivity losses (manual work only) from stunting, iodine deficiency and iron deficiency together are responsible for a total productivity loss of almost 3% of GDP.

A recent World Bank India: Malnutrition report 2009 says that the loss of human potential due to under-nutrition would lead to a GDP loss of 2-3% and can lead to 10% reduction in lifetime earnings. Also, the nutrition related factors are responsible for 50% of the 2.1 million deaths of under 5 in India each year. 40 million populations suffer from energy deficiency owing to malnutrition in India.

Low nutritional status of women emerges as the most pervasive cause of low birth-weight babies and poor growth. Presently 30% of the new-born are with low birth weight. A study of 36 developing countries found that most countries had substantially less underweight than overweight among women. The exception was India where very high prevalence of undernourished women was found (23.1% of urban and 48.2% of rural women). Women with low status tend to have weaker control over household resources, less access to information and health services, no control over spacing of child births, low marriage age which affects her nutritional status.

The first 2 years of life is the most critical phase for nutrition, which leads to irreversible damage into adult life. However, the major focus on food supplements. There is a need to focus on the impact of under nutrition across women's life cycle and not just on pregnant and lactating women. The focus should be on improving the status of women, coming under nutrition. Approximately 60 million children particularly from the marginalized communities younger than 2 years old are underweight in India. Given its impact on health, education and productivity, persistent under nutrition is a major obstacle to human development and economic growth in the country, especially among the poor and the vulnerable, where the prevalence of malnutrition is highest. The progress in reducing the proportion of undernourished children in India over the past decade has been modest but slower than what has been achieved in other countries with comparable socioeconomic indicators. While aggregate levels of under nutrition are shockingly high, the picture is further exacerbated by the significant inequalities across states and socioeconomic groups-girls, rural areas, the poorest and scheduled tribes and castes are the worse affect and these inequalities appear to be increasing.

In India, child malnutrition is mostly the result of high levels of exposure to infection and inappropriate infant and young child feeding and caring practices, and has its origins almost entirely during the first two to three years of life. However, the commonly-held assumption is that food insecurity is the primary or even sole cause of malnutrition. Consequently, the existing response to malnutrition in India has been skewed towards food-based interventions and has placed little emphasis on schemes addressing the other determinants of malnutrition.

Under nutrition, both protein-energy malnutrition and micronutrient deficiencies directly affects many aspects of children's development. In particular, it retards their physical and cognitive growth and increases susceptibility to infection and disease, further increasing the probability of being malnourished. As a result, malnutrition has been estimated to be associated with about half of all child deaths and more than half of child deaths from major diseases, such as malaria (57 percent), diarrhea (61 percent) and pneumonia (52 percent), as well as 45 percent of deaths from measles. In India, child

malnutrition is responsible for 22 percent of the country's burden of disease.

A. Selection of Districts



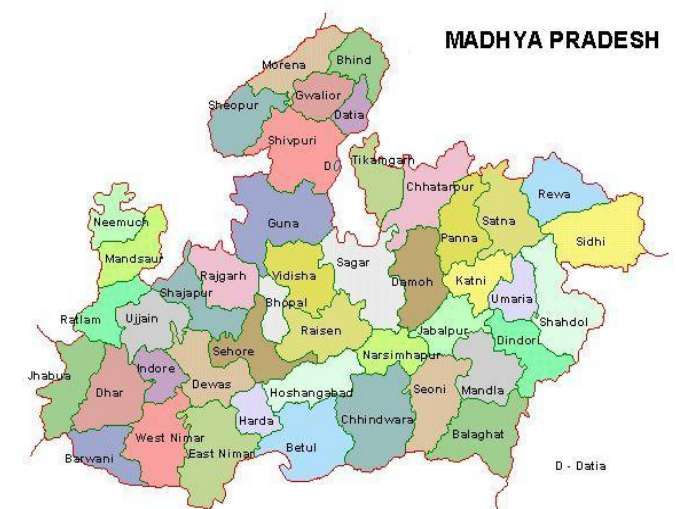
The geography of Madhya Pradesh is varied; the state has a number of different agro- climatic regions. For the purpose of this study, five districts of South-West regions of Madhya Pradesh have been selected, namely: Khandwa ,Jhabua , Burhanpur,Khargone and Alirajpur.

B. Selection of Blocks

In each district, two blocks have been selected: one that is easily accessible and is close to the district head quarter and the other that is remote.

C. Selection of Villages

The villages were elected on the basis of malnutrition reported by the government and various Non-governmental organization NGOs. A total of 5 villages were selected from each block where higher level of malnutrition reported. Total of 10 villages selected in each district of Primitive Tribal Groups. Total 50 villages have been selected for survey and study in 10 blocks of 5 districts of South-West Madhya Pradesh.



II. LITERATURE REVIEW

Harold, Simon, Lawrence, Lina, Yisehac (2001) analyzed that impact of child malnutrition on GNP growth. This study explores that question using household data from twelve countries. In addition, data on the malnutrition rates since the 1970s available from a cross section of countries are employed in this investigation. Both forms of analysis yield similar results. Income increases at the household and at the national level imply similar rates of reduction in malnutrition at the same rate of increase income. Using these estimates we find that goals of halving the levels of child malnutrition in the first two decades of this century set by the 1990 UNICEF World Summit on Children or the 1996 FAO-WHO World Food summit are unlikely to be met through income growth. Thus a combination of growth and specific nutrition programs will be needed.

F. N. Uchendu (2011) concluded that Micronutrient malnutrition is a serious childhood dietary problem in developing nations. Deficiencies in vitamins A and B, iron, folic acid and zinc, are preventable causes of poor childhood growth and school performance. Sustainable strategies exist to eradicate malnutrition. This paper discusses the negative effect of vitamin and mineral malnutrition on childhood growth and education, and effective strategies to eliminate them.

Jacinta A. Opara, Helen E. Adebola, Nkasiobi S. Oguzor and Sodienye A. Abere (2011) Found that consequences of malnutrition during pregnancy among child bearing mothers in Mbaitolu Local Government Area of Imo State, Nigeria. The study also identifies the cause of consequences among child bearing mothers. Findings revealed that abortion and premature delivery can be as a result of malnutrition. The finding of the study also revealed that malnutrition in pregnancy result in offspring with low birth weight and high risk of prenatal mortality. The study of the finding further showed that socio economic factors, cultural beliefs are some of the causes of malnutrition in pregnant mothers. Based on the findings the following recommendations were made. That adult educators, midwives, medical doctors should assist in educating the child bearing mothers on how to eat balanced diet. This will help to reduce problems of malnutrition in childbearing mothers.

Jacqui O'Flynn, Hilary Peake, Mary Hickson , David Foster, Gary Frost (2005) defined that in practice the prevalence of malnutrition in hospital can be influenced by the implementation of a variety of nutrition care strategies. These strategies should be multi-disciplinary and target identification of malnutrition and its treatment.

Kaneta K. Choudhury, Manzoor A. Hanifi, Sabrina Rasheed, Abbas Bhuiya (2000) studied that the Bangladesh typifies many south-eastern countries where female children experience inferior health and uncertain survival, especially after the neonatal period. This paper attempts to study the gender inequality in nutritional status and the effects of various socioeconomic, demographic, and health-programme factors on gender inequality in a remote rural area of Bangladesh.

Lucia luzi (2010) investigated the long-term effects of malnutrition presented by individuals during early childhood on subsequent education attainment of young adults living in a rural area of Tanzania.

Barun Kanjilal, Papiya Guha Mazumdar, Moumita Mukherjee, M Hafizur Rahman (2010) measured that the extent of socio-economic inequality in chronic childhood malnutrition across major states of India and to realize the role of household socio-economic status (SES) as the contextual determinant of nutritional status of children.

Jacques be-ofuriyua emina, ngianga-bakwin kandala, joseph inungu (2011) examined that the effect of maternal education on the nutritional status of children depend on the nutritional indicator used (stunting, wasting, or combined malnutrition), the region of residence, and the socioeconomic strata. Therefore any study on the determinants of children nutritional status should be based on a clearly defined nutritional indicator. In addition only national policies integrating education, access to food and use of health service are pivotal to improve child health and nutrition.

Jatinder K. Gulati (2011) suggested that one out of every three children under five in developing countries is malnourished. Data clearly shows that the worst affected region is South Asia. 50 percent of children in the whole of South Asia are not able to meet their food requirements and are therefore undernourished. Half of the world's malnourished children are to be found in just three countries, Bangladesh, India and Pakistan. In a recent World Bank report (2005) it is indicated that 47 percent of Indian child population under five is still malnourished.

III. OBJECTIVES

The present study was carried out to investigate the malnutrition situation in Madhya Pradesh, the effects of malnutrition on attainment of education and skills; the effects of malnutrition on the productivity,; and finally, find out the certain strategies to come out from under nutritious condition in Madhya Pradesh.

IV. METHODOLOGY OF THE STUDY

The study is based on primary and secondary data, with a survey research design for collecting primary data, and the use of government reports, websites. The methods employed for data collection are of two kinds: The first method of data collection or schedule contains a set of questions for various respondents of the families which is reported under nutrition, self help group workers, and teachers. Similarly, a schedule designed for interaction with parents of children identified as being in Grade III or Grade IV level of malnourishment by the anganwadi workers has also been used. The second method of data collection or schedule is based on focus group discussions in the village to elicit further information regarding malnourished children. It is a qualitative method for data collection. In this study, focus group discussions have been conducted in the community to observe & understand the community response to various cases. The focus group discussions were conducted in areas where the poorest section of the village resides. For making this study more qualitative, case studies from all the five districts have been collected during interactions with community & field staff. In the survey, and 10 villages have been studied in each district, so as to cover 50 villages in 5 different districts of South -West Madhya Pradesh.

V. HYPOTHESES

RQ1: On the condition of malnutrition in Madhya Pradesh.

H1: There is an observable malnutrition in Madhya Pradesh

H0: There is no observable malnutrition in Madhya Pradesh

RQ2: On the relationship between the malnutrition on attainment of education and skills.

H1: There is a significant relationship between malnutrition and attainment of education and skills in Madhya Pradesh.

H0 There is no significant relationship between malnutrition and attainment of education and skills in Madhya Pradesh.

RQ3: On the relationship between the malnutrition on the productivity.

H1: There is a significant relationship between malnutrition and on the productivity in Madhya Pradesh.

H0: There is no significant relationship between malnutrition and on the productivity in Madhya Pradesh

VI. RESEARCH INSTRUMENTS

- Questionnaires are used in the research to collect to data
- SPSS, a computer program, is used to analyze the collected data

VII. MALNUTRITION IN MADHYA PRADESH

The State government's efforts to address malnutrition among children appear half-hearted, as severe malnutrition has claimed the lives of over 450 children under six, in South-West Madhya Pradesh since May 2008, according to figures provided by various NGOs. According to National Family Health Survey-III, malnutrition in the State has increased from 54% to 60%, making MP children the most undernourished in India. Madhya Pradesh also tops the list of States in infant mortality rate (IMR), with 72 deaths per 1,000 live births, according to the Sample registration Survey 2007-08. The Women and Child Development Department, however, has no clue about these deaths as it does not record or maintain data about malnutrition deaths.

SHOCKING REVELATION



Figure 1. Malnourished children from Korku tribe of Khandwa district in Madhya Pradesh

Malnutrition is one of the most serious and large scale health problems facing the M.P. today:

- 46% of children under 5 in India are malnourished
- Over 60% of the children under 5 in Madhya Pradesh are malnourished – the country's highest malnutrition rate -
- Out of these 6 million malnourished children in MP, 1.3 million have severe acute malnutrition (SAM) and another 1 million have moderate acute malnutrition (MAM).
- Madhya Pradesh tribal districts are the worst hit in the country because of their cultural, geographical, and economical isolation with up to 100% malnutrition in some villages.

Children with severe acute malnutrition have extremely high mortality rates – between 20-30% - a rate of death approximately 20 times higher than well-nourished children. Malnutrition is closely tied to MP's infant mortality: one of the highest in India, with 72 out of 1000 children dying every year. This rate translates into an estimated 130,000 children who will die every year. Malnutrition is one of the largest contributors to this alarming rate, constitutes 22% of the country's disease burden because it severely weakens a child's immune system, raising their mortality rates from common diseases such as pneumonia, malaria, and diarrhea. The millions of children who do survive childhood will be forever affected by malnutrition: children who have been malnourished in the first 5 years of life will have limited mental and physical growth capacity as compared to a well-nourished child. There is evidence that a malnourished child will someday have children with low birth weights, perpetuating the cycle of malnutrition. Malnutrition is rampant throughout almost every town in southwestern MP. While traveling through the districts of Jhabua, Alirajpur, Khandwa, and Khargone this June we found malnourished children in every other household at best, in every household at worst.

South-West MP has been one of the states worst affected by malnutrition in India for decades. While Madhya Pradesh's state malnutrition average of 60% malnutrition in children under 5 is already "extremely alarming" according to the Global Hunger Index, malnutrition in the southwestern tribal areas of the state is even more concerning. According to Rural Health Commission the proportion of underweight children in these districts can range from 61-96%.

Madhya Pradesh not only has the highest rates of malnutrition in the nation, but also the accompanying highest rates of severe acute malnutrition (SAM). The District Family Household Survey (DFHS-III) estimates that nearly 12% of children under 5 in MP have SAM. This amounts to nearly 1.3 million children who are dangerously underweight. Considering that the medium case fatality for SAM in India is 23.5% (IAP 2006), it is likely that over 300,000 children will die this year from malnutrition. There are also another 1 million children in MP who have moderate acute malnutrition (MAM) and who can become severe after just one bout of illness. The field reality in Southwest Madhya Pradesh matches the statistics. In many villages we visited, 9 out of every 10 children we screened had some degree of malnutrition, with

roughly 2-3 out of 10 children presenting with severe acute malnutrition.

A. *Looking forward, a cause for great concern:*

The current situation right now in South-western MP is alarming, especially in the context of the deaths reported last year during the monsoon season. We can only expect this year to be worse. Seasonal migration, the economic effects of the delayed monsoon, a particularly bad harvest last year, and higher food prices this year all will compound the already dire situation. Local NGO workers in Khandwa give the season between June and October the dramatic but not inaccurate title, “the season of death.” Each year the monsoon comes at the time when families are the most food insecure, running towards the end of their stocks from the last harvest. The monsoon brings back migrants who were away from their villages for seasonal labor where they often become malnourished because of the higher food prices and unsanitary conditions in the major cities where they migrate. The monsoon brings with it the yearly bout of waterborne diseases, diarrhea, and pneumonia. Entire families are required to work during this period, leaving young children the most vulnerable to improper feeding and care. According to data collected by the NGO Spandan in Khandwa, last year over 55 children died in just 22 blocks that were monitored and recorded in the Khalwa block of Khandwa. There is nothing unique about the Khalwa block besides the fact that it was closely monitored. Similar conditions are found throughout tribal MP and similar death tolls can be expected throughout Southwestern MP.

The monsoon and all the waterborne diseases that it brings will cause a massive spike in malnutrition cases like it does every year. This year the monsoon will also bring with it, economic woes that will further limit individual’s ability to prevent and treat malnutrition. The monsoon is already a week late and isn’t expected until the end of June. This late monsoon has the potential to cause an economic crisis for some families. I observed while driving through many of the states in Southwest MP that many farmers have already planted their seeds, anticipating a timely monsoon. Even with a week to 10 day monsoon delay and with the current heat wave, there is a good chance that those farmers without irrigation (the majority) may lose their seeds before the monsoon comes. If this occurs, these farmers will have to take out loans to get new seeds, putting them further into debt.

B. *Little improvement*

Despite a renewed focus on malnutrition by government, media, and NGOs in South-west MP, there has been little improvement from this year to last year. In a study conducted by the Bhil Rural Community Health Centre in Jhabua, it was found that only 10% of the children screened for malnutrition recovered from May 2008 to May 2009 (not all children could be relocated in 2009. In only 14 villages we found 609 malnourished children out of 3,115. This 20% malnutrition rate is low for the region, but these are all urban villages located fairly close to the Jhabua market, are somewhat more prosperous than other areas of Jhabua, and are villages who receive access to Real Medicine Foundation and Bhil Health and Literacy Society resources (the RMF malnutrition eradication initiative launched, so improvement who this initiative is still hard to measure). The Jhabua NRC is

currently filled over capacity with 21 severely malnourished cases.

In Khargone Spandan organization did a rapid assessment and found that out of 177 children, 107 (60%) were found malnourished, 30% were in grade III and IV alone, 100% of families surveyed answered that they did not have enough food to carry them through the year, with 60% taking out loans and 50% of the families do not attend anganwadis for a variety of reasons

C. *Current capacity to identify, treat, and prevent malnutrition is low in Southwest MP*

The high rates of malnutrition in this region are especially concerning because of the weak treatment and preventative care infrastructure and services available at the community level. Right to Food estimates that Integrated Child Development Scheme (ICDS) currently only covers 36% of MP’s 0-6 population and 30% of the pregnant women. The Anganwadi workers – village health workers who the corner stones to the ICDS scheme - are absent, officially and unofficially, from many towns. Anganwadi workers we were able to track down were insufficiently trained, had irregular attendance records, and rarely made home visits. Adequate supervision of anganwadi centers appears to be lacking. None of the anganwadi helpers, who spend considerable amount of time with the children, had been trained.

D. *Nutritional Status of women*

As per National Family Health Survey NFHS III, Women who are Body Mass Index is below normal in MP are 40.1 % in urban 28.7% and 44.2% women are below normal of BMI in rural. If extent of under-nourishment of children under five is taken as an indicator of the quality of life for the future population, Madhya Pradesh draws a dismissal picture as it has the highest percentage (51%) of children chronically under nourished. Over 60% of the female children under 5 in Madhya Pradesh are malnourished – the country’s highest malnutrition rate. Out of these 6 million malnourished children in MP, 1.3 has severe acute malnutrition (SAM) and another 1 million have moderate acute malnutrition (MAM). MP’s tribal districts are the worst hit in the country because of their cultural, geographical, and economical isolation with up to 100% malnutrition in some villages. Children with severe acute malnutrition have extremely high mortality rates – between 20-30%. A rates of death approximately 20 times higher than well-nourished children. Malnutrition is closely tied to MP’s infant mortality. Malnutrition is rampant throughout almost every town in south western MP. During collecting the data I found that the districts of Jhabua, Alirajpur, Khandwa, and Khargone this June we found malnourished children in every other household at best, in every household at worst. According to data collected by the NGO Spandan in Khandwa, last year over 55 children mostly female died in just 22 blocks that were monitored and recorded in the Khalwa block of Khandwa. There is nothing unique about the Khalwa block besides the fact that it was closely monitored. Similar conditions are found throughout tribal MP and similar death tolls can be expected throughout Southwestern MP.

VIII. HYPOTHESIS TESTING

The hypothesis for the research is: RQ1 There is an observable malnutrition in Madhya Pradesh. RQ2 is on the relationship between the malnutrition and attainment of education and skills. H1: There is a significant relationship between malnutrition and attainment of education and skills in Madhya Pradesh. H0 There is no significant relationship between malnutrition and attainment of education and skills in Madhya Pradesh. RQ3 is on the relationship between the malnutrition on the productivity. H1: There is a significant relationship between malnutrition and on the productivity in Madhya Pradesh. H0: There is no significant relationship between malnutrition and on the productivity in Madhya Pradesh.

Calculated value of data on SPSS for RQ1, RQ2, and RQ3 are accepted at 5% significance level. It means there is high level of malnutrition in socially and economically backward class in Madhya Pradesh. The people who got affected by malnutrition they have poor educational attainment. Either these children have not enrolled in the schools or their dropout rate is 90%. Such people are physically as well as mentally very weak. It was also found that the capacity of productivity among such people is very low. Some where it is found those people are severely affected their productivity is negligible.

IX. FINDINGS

- Approximately 60 million children are underweight in Madhya Pradesh. Given its impact on health, education and productivity, persistent under nutrition is a major obstacle to human development and economic growth in the country, especially among the poor and the vulnerable, where the prevalence of malnutrition is highest. The progress in reducing the proportion of undernourished children in Madhya Pradesh over the past decade has been modest and slower than what has been achieved in other states with comparable socioeconomic indicators. While aggregate levels of under nutrition are shockingly high, the picture is further exacerbated by the significant inequalities across states and socioeconomic groups – girls, rural areas, the poorest and scheduled tribes and castes are the worst affected – and these inequalities appear to be increasing.
- In Madhya Pradesh, child malnutrition is mostly the result of high levels of exposure to infection and inappropriate infant and young child feeding and caring practices, and has its origins almost entirely during the first two to three years of life. However, the commonly-held assumption is that food insecurity is the primary or even sole cause of malnutrition. Consequently, the existing response to malnutrition in India has been skewed towards food-based interventions and has placed little emphasis on schemes addressing the other determinants of malnutrition.
- Disaggregation of underweight statistics by socioeconomic and demographic characteristics reveals which groups are most at risk of malnutrition. Most growth retardation occurs by the age of two, and is largely irreversible. Underweight prevalence is higher in rural areas (50 percent) than in urban areas (38 percent); higher among girls (48.9 percent) than among boys (45.5

percent); higher among scheduled castes (53.2 percent) and scheduled tribes (56.2 percent) than among other castes (44.1 percent); and although underweight is pervasive throughout the wealth distribution, the prevalence of underweight reaches as high as 60 percent in the lowest wealth quintile. Urban-rural, inter-caste, male-female and inter-quintile inequalities in nutritional status widened.

It was found that the children who have suffered from under nutrition, either they have not gone to school or there dropout rate is very high at primary or middle level.

X. CONCLUSION AND SUGGESTIONS

Madhya Pradesh, a state of 60 million of population, where the worst malnutrition indicators in India have been reported. An estimated 60% of children in this state are malnourished, leading to the Global Hunger Index to place MP in between Chad and Ethiopia in its list of the world's worst malnutrition ratings. An estimated 1.25 million children in the state have severe acute malnutrition (SAM) and another 1 million are living with moderate acute malnutrition (MAM). This alarming rate is tied to the high level of poverty in the state; the 2007-2008 District Household and Facility Survey found that 76.5% of the households in Madhya Pradesh have a low standard of living. Treating the malnourishment, bringing the children back to normal growth patterns, and ensuring that there are no relapses by educating the children's families on preventing malnourishment By building the capacity at local health centre's and dispensaries to identify acute malnutrition and treat uncomplicated cases, government will be able to reach a larger portion of target population, the most rural and vulnerable populations of the state. Early treatment is also more cost effective when combined with a community based approach. This catalytic activity will strengthen existing systems, structures, and management capacity of partners at the most local and grass root levels to address the issues of the most marginalized and vulnerable populations in state. Following steps can be more effective-

- Community level involvement in all planning processes for identification, treatment, and prevention of malnutrition.
- Immediate emergency response team to address the problem: This should be a consortium of all government departments and NGOs that relate to these malnourished children and their families so that relief efforts can be coordinated based on capacity and core competencies of each organization involved
- Provide on the ground job training to both Anganwadis and Anganwadi helpers on malnutrition identification, treatment, and prevention
- Increased AWC, NRC, PDS, and block hospital supervision and conduct random spot check. Will hold AWW and other government officials accountable
- Make AWCs child friendly -with just a donation of second hand toys and some paint, a local anganwadi center can be transformed into a place where children want to attend and will stay longer.
- Mobile clinics for remote tribal areas

- Production of local supplements for moderate malnutrition by village level self-help groups and social businesses
- Genetic studies and advanced lab studies to look at the vulnerability of tribal people to various diseases
- Create long-term community-based therapeutic care program to continue on throughout the year to decentralize malnutrition care and treatment and make it more accessible to children residing in interior villages.
- Household-level food security is required. This refers to physical and economic access to foods that are socially and culturally acceptable, and of sufficient quality and quantity.
- Access to health resources. Access to sufficient clean water, good sanitation and a clean living environment. Access to health services, including vector and disease control.
- Adopting appropriate childcare behaviours.

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